Monitoring Study Group Meeting Minutes

November 16, 2011
CAL FIRE Shasta-Trinity Unit Headquarters
Redding, California

The following people attended the MSG meeting: George Gentry (BOF—MSG chair), Dr. Matthew Buffleben (NCRWQCB), David Fowler (NCRWQCB), Ed Struffenegger (CFA), Peter Ribar (CTM), Drew Coe (CVRWQCB), Duane Shintaku (CAL FIRE), Dennis Hall (CAL FIRE), Clay Brandow, (CAL FIRE), Rich Klug (Roseburg Resources Co.), Curt Babcock (DFG), Shane Cunningham (CAL FIRE), Adam Wyman (CAL FIRE), Bill Brock (USFS-STNF), Christine Mai (USFS-STNF), Stuart Farber (WM Beaty and Associates), Dr. Lee Benda (ESI), Dr. Michael Wopat (CGS), Dr. Cajun James (SPI), and Pete Cafferata (CAL FIRE). Participating by conference line: Richard Gienger (public) and Bill Stevens (NMFS). **[Action items are shown in bold print]**.

The meeting began with general monitoring-related announcements:

- The statewide Coho Recovery Team (CRT) will be meeting in Sacramento on November 29-30, 2011. For more information, contract Dr. Stephen Swales, DFG, at SSWALES@dfg.ca.gov.

- At their November meeting, the State Board of Forestry and Fire Protection (BOF) put the road rules package out for a 90-day comment period that will conclude with an initial public hearing on April 4, 2012. The purposes of the extended comment period are to allow for field trips and focused workshops (to occur after the first of the year), and to provide the time necessary for a thorough review of this lengthy rule proposal. The 90-day notice is posted at: http://www.bof.fire.ca.gov/regulations/proposed_rule_packages/interagency_road_rules_2010/90-daynotice_roadrulestext_112211.pdf

- Drew Coe briefly summarized the Battle Creek Interagency Task Force Report titled "A Rapid Assessment of Sediment Delivery from Clearcut Timber Harvest Activities in the Battle Creek Watershed, Shasta and Tehama Counties, California." The report is posted at: http://www.bof.fire.ca.gov/board_business/other_board_actions/battle_creek_report/final_battlecreek_taskforce_report.pdf. The Task Force's presentation to the BOF is posted at: http://www.bof.fire.ca.gov/board_business/other_board_actions/battle_creek_report/battlecreekassessment.pdf.

- Matthew Buffleben announced that he is a co-author with Randy Klein and Jack Lewis on a paper being published by the journal Geomorphology titled "Logging and Turbidity in the Coastal Watersheds of Northern California." The abstract for this in press paper is located at: http://www.sciencedirect.com/science/article/pii/S0169555X11005277

- Cajun James announced that Dr. Lee MacDonald, CSU, is assisting her with the cooperative Judd Creek watershed study and that he will be present in the watershed much of the month of June 2012. She stated that field visits to the watershed with Lee are possible. Additionally, she will be hiring two watershed technicians this coming summer.

- Pete Cafferata announced that Dr. Lee MacDonald and Dr. George Ice, NCASI, are both retiring in June 2012.

- Richard Gienger announced that pilot PTHPs for the recently approved Mattole River PTEIR were submitted to CAL FIRE for review during the week of November 14th.

- George Gentry announced that very shortly the BOF's website will be modified to allow interested parties to subscribe to a list server system, similar to what is in use by the State and Regional Water Board websites.

Recruitment of Large Woody Debris into California Watercourses

Dr. Lee Benda, Earth Systems Institute, provided a PowerPoint (PPT) presentation titled "Recruitment of Large Woody Debris into Watercourses in California." This PPT provides an overview of the paper written by Lee and Paul Bigelow titled "Recruitment, Storage, Transport and Function of Wood in Northern California Streams." **This paper was jointly funded by CTM, SPI, and CAL FIRE and a draft version should be available within two weeks.** The PPT is posted at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/msg_archived_documents_/benda_california_large_wood_ppt.pdf.

Wood data for the paper was collected from 2002 to 2006 as part of several different studies. Combined, 93 km (~58 miles) of streams were evaluated with drainage areas less than 70 km^2 (~17,000 acres) in four regions of northern California with different histories of forest management (managed, less-managed, and unmanaged). Study areas were located in the Coast Ranges, Klamath Mountains, Cascade Range, and Sierra Nevada. Wood recruitment was evaluated using wood budgeting, which estimates the processes and rates of wood recruitment, storage, transport, and decay. Primary recruitment methods are mortality, bank erosion, landsliding, and fire (not evaluated). Measurements were made along reaches 300 to 1000 m in length, primarily on Class I and II watercourses, and sources of wood recruitment were recorded when possible. Field data were collected by Paul Bigelow and Kevin Andras. Key questions to be answered included: (1) relative importance of different recruitment processes, (2) effects of past timber harvest, (3) spatial variability, and (4) effects of different climates, topographies, and basin sizes.

The coast-unmanaged sites had considerably higher biomass density than any of the other eight region-forest management groups evaluated. Higher spatial variability was recorded in total wood storage and was driven by recruitment process (e.g., much higher loading where debris flows enter the channel). Overall, the highest total wood storage was found in the coast region, where historical logging debris can be a significant source of wood in second growth forests, followed by the Klamath Mountains, with the lowest loading found in the southern Cascades. Wood loading averaged 5-20 times higher in the coast region compared to the inland areas due to higher forest biomass and longer residence times. Woody debris residence time was highest in the coast-unmanaged group, followed by the coast-managed type. An average of 46% (range 20-60%) of the wood pieces could be linked to recruitment process. In second growth coast redwood forests, logging debris was the dominant source, while in old-growth areas, the main recruitment mechanism varied by watershed and reach location in the basin. Mortality was substantial across all groups (mean 50%), followed by bank erosion (43%), and mass wasting (7%). Landslide input occurred in the coastal, Klamath, and Cascade regions, ranging from 11-22% of total recruitment. Overall, no strong patterns in recruitment process were observed across the regions. General west to east gradients (higher in the west) were recorded for total biomass, residence time, and total wood storage.

Source distance curves were strongly influenced by dominant recruitment process present. Managed forests in the Sierra and Cascades without landsliding had 90% of wood originating from within 10 m of the channel (where the dominant process is bank erosion). In contrast, 90% of wood originates from within 30 m of the channel in managed coastal forests, where landslides are more important. In unmanaged basins with taller coast redwood and sequoia forests, the source distance for 90% of the wood is between 35 and 50 m. Dr. Benda stated that: (1) source distance curves depend on managed vs. unmanaged forests (tree height), and (2) local controls dominate.

The mean piece size in wood jams was approximately 0.7 m in diameter and enters primarily due to bank erosion in managed forests and by mortality in unmanaged forests. Wood was very important in forming pools in the coast region (e.g., 78% in the coast-managed group), but less in the Cascades

and Sierra Nevada. Boulder formed pools dominated in the Cascades and boulder and bedrock pools dominated in the Sierras. Wood transport distances were modeled, not directly measured. Results showed that in small headwater streams, average transport distances may be a couple of hundred meters, suggesting that only the lower portion of headwater channels may transport woody debris to larger fish bearing streams. Transport distance increases with drainage area.

Results from this study are generally comparable to those published earlier by Lisle (2002), but differ from those reported by Wooster and Hilton (2004), who evaluated managed second growth coast redwood streams that had been heavily "cleaned." Overall conclusions are that: (1) there is huge variability at the reach and valley segment scale (factor of 30), mostly driven by recruitment process; (2) the largest wood storage is seen in the coast region–decreasing to the Sierras; (3) there is no province scale effect on variation in recruitment processes (except that there is more landslide wood in the coast region); (4) the source distance of wood is dependent on process and on tree age (height); (5) key pieces that form pools average approximately 0.7 m; and (6) there are greater wood formed pools in coastal region and less in the Klamath/Sierras regions.

Following the presentation of summary information from the wood paper, Dr. Benda included a short segment of the PPT prepared by Paul Bigelow on extensive incision of low order coastal streams resulting from legacy tractor logging, where small streams were filled with slash and sediment for use as skid trails, landings, and roads. Paul asked whether TMDLs acknowledge this massive source of sediment, why contemporary research focuses more on incision from current logging practices, and why there has been little research on the amount of sediment currently contributed from legacy tractor logging (and its trajectory).

Dr. Benda then addressed the implications of the large wood study for riparian zone management in California. He asked if rule-based uniform riparian buffer strips are the best ecological approach in spatially heterogeneous watersheds that have been heavily disturbed, particularly in the context of climate change and listed species, or is it a dated policy that is easy to implement and monitor compliance. There was general agreement that on federal lands the trend over the past 20-30 years has been to create riparian reserves, while on non-federal timberlands, there has been movement in that direction (noting that section V of the Anadromous Salmonid Rules allows for site-specific management). The consequences of uniform, prescriptive riparian buffers may include: (1) age/species uniformity (reduced variation), (2) dense forests with slow growth, (3) high fuel loads (high fire risk), (4) slow in-stream wood accumulation, (5) poor fish habitat conditions, and (6) poor mammal and avian habitat conditions. Dr. Benda presented the argument that spatially explicit riparian management offers options for improvement, including augmenting in-stream wood loading, thinning overly dense second growth riparian stands, converting tree species, improving primary productivity with light openings, and reducing the risk of catastrophic fire with thinning/fire breaks.

Update on NetMap Tools and Coverage

Dr. Benda presented a PPT update on NetMap, a community-based watershed science system consisting of uniform digital databases of common numerical structure and shared analysis tools (see: http://www.netmaptools.org/). NetMap is a unique community system in the applied watershed sciences, with the current focus on the western United States. It's shared digital landscapes and analysis tools are technically and economically efficient because it leverages the expertise, ideas and funding from many different stakeholders (state and federal agencies, universities, NGOs, private industry, etc.). The PPT is posted at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/.

NetMap is comprised of a suite of 70 analytical tools (heavily habitat-based) and 100 parameters that work within ESRI ArcMap (9.3/10) and, in 2012, "Watershed Explorer", a web browser based system of easily accessible maps and data on various landscape attributes (i.e., user friendly analysis tools). The dual set of tools are designed to provide decision support for different types of resource management, restoration and conservation activities. They address various aspects of hillslope and

fluvial geomorphology, aquatic habitats, erosion, watershed disturbance, road networks, wildfire, hydrology, large wood in streams, and climate change, along with other processes. NetMap allows for multi-scale analysis and routing of spatial data, including flow and sediment. It also offers a platform for other types of tools, as well, including WEPP for estimating surface erosion, burn severity for UFSF BAER assessments, and fire severity using fire models. Cooperating agencies (USFS, BLM, EPA, NOAA, etc.) share in database and tool development and cost. NetMap's uniform digital watersheds extend across most of Washington, Oregon and northern California, as well as southern coastal Alaska. The menu driven NetMap tools require little GIS experience and a Google Earth interface is available.

Dr. Benda presented a recently completed example of an application of NetMap in the Clearwater River watershed of western Montana (1,016 km^2 or 250,000 acres). This analysis demonstrates how the NetMap community science system can be applied to restoration planning. NetMap utilized a 10-meter digital elevation model (DEM), a road layer, information on fire risk, watershed function and anticipated habitat condition from the USFS, and distribution of cutthroat and bull trout by Montana Fish Wildlife and Parks to explore road-related restoration opportunities. The objective of this analysis was to evaluate the road network in the Clearwater basin to demonstrate a process of prioritization for: (1) improving road drainage and reducing surface erosion to high quality fish habitat; (2) improving fish passage at road crossings; (3) stratifying roads for effectiveness monitoring; and (4) extrapolating and/or forecasting basin-wide effects of road restoration programs.

NetMap road analysis tools were used for the Clearwater River watershed analysis. Road density was calculated at the scale of stream reaches (100 m), rather than just for large sub-watersheds, and then linked with hillslope erosion potential and habitat sensitivity. Other road tools were used to: (1) predict road failure potential, (2) calculate road drainage diversion potential, (3) predict road surface erosion into streams using WEPP, and (4) map floodplain extent and roads in floodplains. Automated tools were used to search for overlaps between erosion and habitat scores to prioritize road restoration or abandonment, as well as to stratify road segments by erosion potential for maintenance and monitoring, and to determine where upgrades are needed for fish passage at crossings. A detailed final report on this project is available from Dr. Benda.

NTMP Monitoring by the North Coast Water Board and CAL FIRE

Matthew Buffleben, Clay Brandow, and Pete Cafferata provided a PowerPoint presentation on NTMP monitoring that has been conducted this summer and fall on non-industrial timberlands within the North Coast Regional Water Quality Control Board's (NCRWQCB) North Coast Region (posted at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/.) Matthew presented background information explaining why this monitoring effort was undertaken. On June 4, 2009, the Regional Water Board adopted Order No. R1-2009-0038, Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region (Timber Waiver). The Timber Waiver includes conditions for controlling sediment discharges and temperature increases that also implement TMDLs in impaired waterbodies throughout the North Coast region. It includes updated and additional conditions for NTMPs, including those that were previously enrolled under the Categorical Waiver, Order No. R1-2004-0016. Three petitions for review were filed with the State Water Resources Control Board regarding the inclusion of NTMPs. The Regional Water Board adopted Order No. R1-2011-0038, that stayed the NTMP provisions in Order No. R1-2009-0038, to allow Regional Water Board staff to review the protection levels currently being applied to NTMPs. The RWQCB did not intend for the Timber Waiver to create unnecessary regulatory burdens on CAL FIRE or NTMP landowners, or to create conditions that are duplicative of adequately-protective Forest Practice Rules.

Three Regional Water Board investigations were initiated: (1) a file review to evaluate how older NTMPs are updated in accordance with revised Forest Practice Rules, (2) "gap" analysis to identify sections of the Forest Practice Rules that are inadequate to protect water quality, and (3) a field review. The field review has been used to assess whether use of Erosion Control Plans and/or Road

Plans are necessary for NTMPs in order to meet water quality standards, and to collect field data on the frequency of sediment discharge, or the potential of sediment discharge, from stream crossings and logging roads within NTMPs. This work has been conducted by the NCRWQCB in cooperation with CAL FIRE.

CAL FIRE staff developed a list of 131 NTMP Notice of Timber Operations (NTOs) submitted from November 11, 2007 to July 17, 2011, the period when CAL FIRE has jurisdiction for site inspections, in the North Coast Region. The list was then randomized, with a 10% tier (13 NTMP NT0s) to be monitored by October 31, 2011, and a 20% tier (26 NTMP NTOs total) to be completed by the end of the year. Only NTOs that have overwintered at least one year were used to test practice effectiveness. In addition, a limited number of older, non-random NTMPs have been monitored when permission has been granted by the landowner and RPF. Water Board staff have evaluated NTMPs with a stream crossing effectiveness form (slightly modified from FORPRIEM), a road effectiveness form, and an overall effectiveness form. Selection of road segments and crossings are not random. CAL FIRE has used its FORPRIEM monitoring forms for the random NTMP NTOs, evaluating road implementation and effectiveness on a random 660-ft road segment, WLPZ canopy and erosion features on a random 200-ft segment, and watercourse crossing implementation and effectiveness on two random crossings. The majority of the NTMP NTOs have been located in Mendocino County. Photographs and maps illustrating examples of several plans monitored were shown as part of the PPT. Monitoring forms and photos for some of the monitored plans are posted at the following ftp site: ftp://frap.cdf.ca.gov/pub/incoming/IMMP/NTMP%20Monitoring%202011.

Preliminary FORPRIEM results for 14 NTMP NTOs (13 with Class I or II WLPZs) show that WLPZ total canopy averaged 87% for Class I watercourses and 94% for Class II watercourses (92% combined). The majority of the 14 random road segments (1.75 mi or 9,240 ft total) were native-surfaced seasonal roads. Approximately 82% of the waterbreaks rated had acceptable implementation, with 17% and 1% having marginally acceptable and departure ratings, respectively. Roughly 11% of the total road segment length had erosion on the road surface, 6% on the cutslope, and 2% on the fill slope. Twenty-five random crossings were rated for implementation and effectiveness. Sixty percent were culverts and all crossings were found in Class II or III watercourses. Sixty-eight percent of the crossings had all the crossing Forest Practice Rules rated as acceptable implementation; 8% had marginally acceptable ratings, and 24% had Rule departures. Twenty-one percent of the crossings had no effectiveness problems; 79% had one or more minor problems, and 17% had major problem(s). These preliminary canopy, road, and crossing results are generally similar to those reported for Timber Harvesting Plans (THPs) monitored from 2001-2004 with CAL FIRE's Modified Completion Report monitoring program (see: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_monitoring_reports/mcrfinal_report_2006_07_7b.pdf).

Matthew Buffleben stated that he has not summarized Water Board rating form data to date. Preliminary observations by Matthew and David Fowler are that NTMPs with active NTOs generally do not have significant logging-related erosion problems; the majority of problems recorded have been non-timber related (cattle tramping, hunting access, etc.). Inactive plans or plans without NTOs have had a greater number of problems, often related to inadequate crossings on headwater watercourses and inadequate ditch relief culverts. **Water Board staff plan to have a report available in February or March of 2012. Next steps in the process include: (1) Regional Water Board and CAL FIRE will continue to conduct field surveys until the end of the year, (2) Regional Water Board staff will propose an extension of the limited-term Waiver amendment to August 2012 at the January Board Meeting, and (3) Water Board staff will hold workshops in March and April 2012 to review monitoring results and gather input for changes to the Waiver.** It is likely that the NCRWQCB will make NTMPs a new, separate Waiver category.

Ed Struffenegger and Cajun James suggested that road segments used by neighbors (shared roads), County (public) road users, illegal trespassers, etc. can strongly influence these monitoring results. They urged Water Board staff to separate out road ownership categories when reporting monitoring

data. Matthew and David stated that a concerted effort has been made to only include landowner-controlled roads, but that in some cases, impacts will be hard to differentiate.

Update ASP Rule—Section V Technical Advisory Committee (VTAC) Activities

Pete Cafferata provided a brief update on Anadromous Salmonid Protection (ASP) rule Section V Technical Advisory Committee (VTAC) activities (the PowerPoint presentation is posted at: http://www.bof.fire.ca.gov/board_committees/monitoring_study_group/msg_archived_documents/). The main tasks of the VTAC are to: (1) develop a general guidance document that will allow for broad application of the site-specific approach for riparian management under Anadromous Salmonid Protection Rule 14 CCR 919.9 (v), and (2) help develop and implement at least two pilot projects to demonstrate site-specific riparian management. This approach offers an alternative to prescriptive uniform buffer strips, giving landowners increased flexibility to manage riparian zones based on site-specific needs. CAL FIRE established the VTAC in October 2010 and 9 meetings have been held over the first year, including one field meeting on Soquel Demonstration State Forest.

The primary types of potential riparian projects are: (1) placement of large wood in fish-bearing watercourses using conifers from the Core and Inner Zones of the WLPZ, (2) thinning trees in the Core and Inner Zones to accelerate tree growth, (3) modifying stand composition in the WLPZ to restore conifer stocking or develop a more appropriate mixture of conifers and hardwoods, and (4) management in the WLPZ to reduce the chance of catastrophic wildfire with fuel hazard reduction projects (e.g., thinning). Examples of past wood enhancement projects on Jackson Demonstration State Forest and Campbell Timberland Management watercourses were provided, as were examples for the other types of potential projects described above.

To improve acceptance of 916.9(v) and to gain a better perspective on regulatory requirements that landowners may face when trying to implement an section V plan, an online survey was created in Spring 2011. Notice of the electronic survey was sent by email to landowners, Registered Professional Foresters (RPFs), agency personnel, and the public. The survey produced 123 responses, with approximately half being RPFs. The primary take-home messages from the survey are that: (1) there is widespread agreement that site-based riparian management can be used where it is technically justified; (2) an increased level of certainty is required for extensive use of the Section V process; and (3) successful pilot projects are needed to demonstrate to landowners that this approach can work.

A partially completed draft VTAC guidance document has been produced by VTAC Chair Mike Liquori, with sections on background information, pre-consultation guidelines, analytical methods, a toolbox for potential riparian assessment techniques, templates for RPFs to facilitate use of the guidelines, watershed context assessment, submission requirements, proposal processing, and monitoring strategies. The VTAC pre-consultation guidelines are complete; this is a voluntary process that will allow landowners to rapidly determine the potential success of their project. The three main analytical approaches to satisfy the 916.9(v)(3) pathway are the use of a set of matrices, the use of situational examples, and watershed analysis for expert users. The guidance document will also include a watershed context assessment section and encourage project proponents to use existing documents where possible (e.g., TMDL assessments, listed species recovery plans). Several potential pilot project landowners have been contacted and the VTAC is working towards receiving firm commitments for multiple projects. **The VTAC plans to produce a complete draft version of the guidance document by the end of 2011, establish pilot projects in the winter of 2012, and present the final guidance document to the BOF in July 2012.**

Next Monitoring Study Group Meeting Date

The next MSG meeting date was tentatively planned for February 2012, with the location to be determined. When a definite date, venue, and agenda are available, this information will be emailed to the MSG contact list.